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(54) Abstract Title  
Scooter for a young child

(57) The scooter has steering means 12 on a vertical shaft 11 operable to rotate a plate 2 with two wheels 21, 22 at the forward end of the scooter, which has two rear wheels 31, 32 at fixed locations. To prevent tipping over of the scooter when driven by a child by opposite swinging movements of the plate 2, the plate has a forwardly extending arm 23 with a wheel 24 at its end, such wheel being able to rotate in any direction in its mounting on the arm.

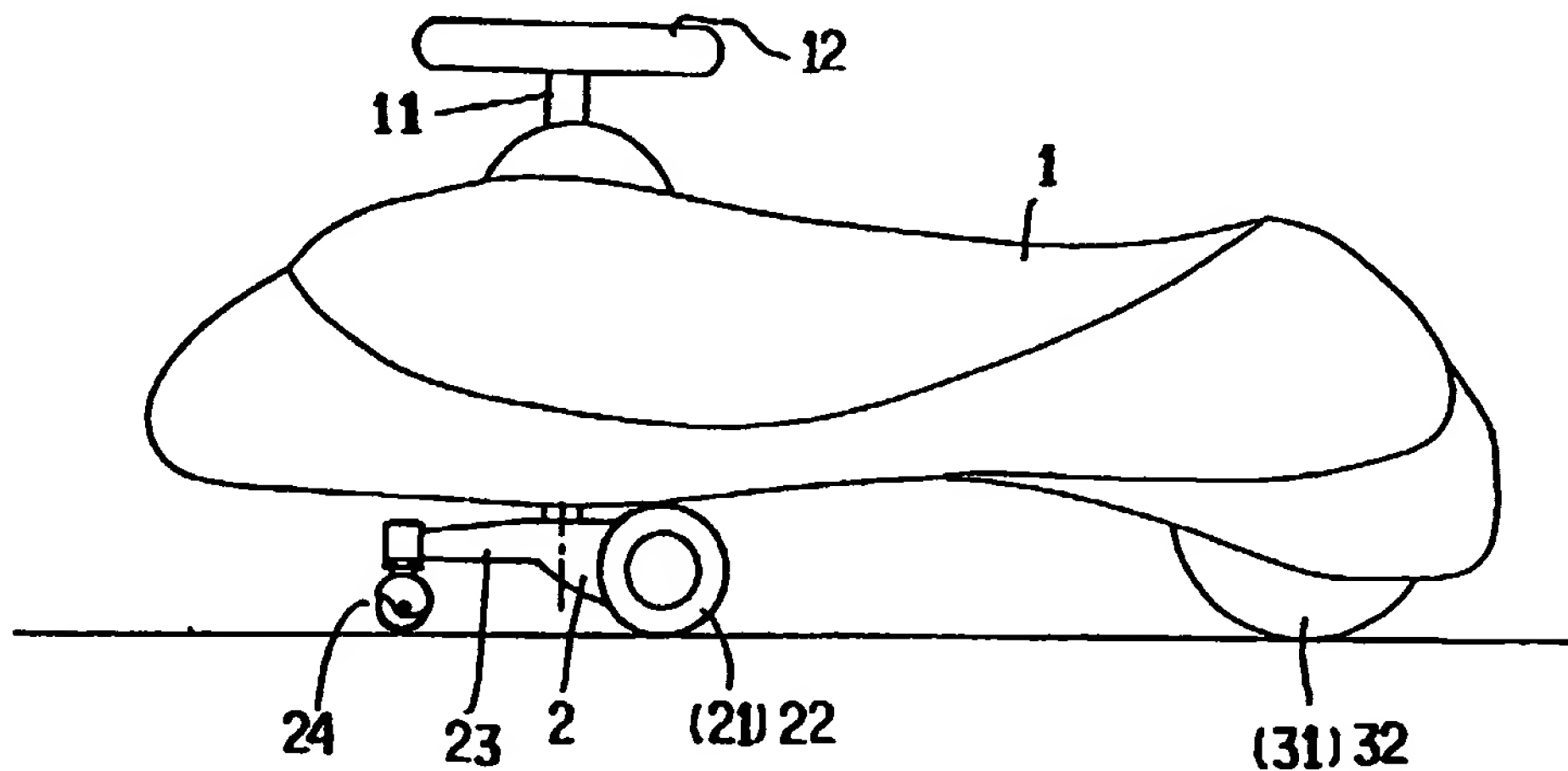
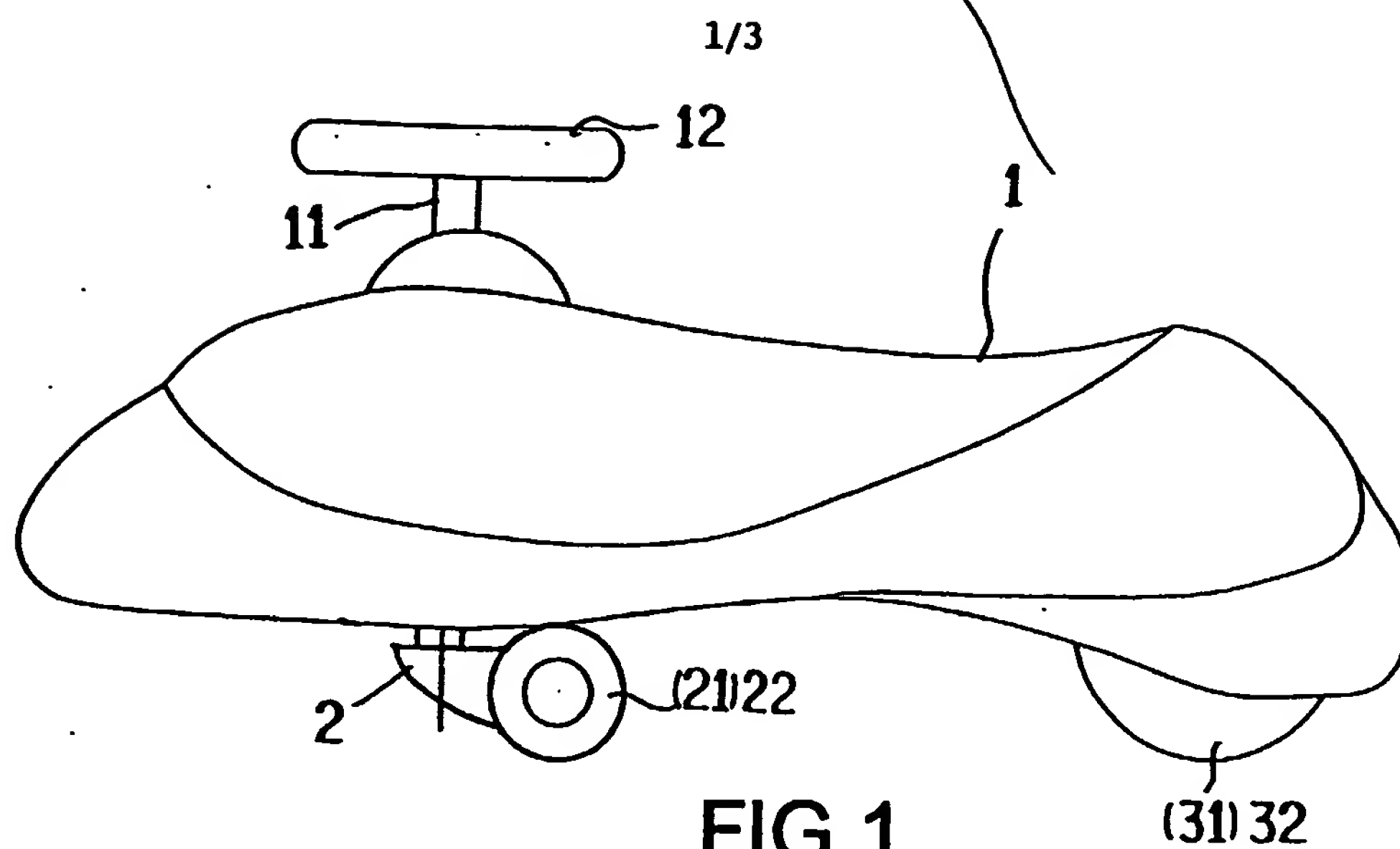
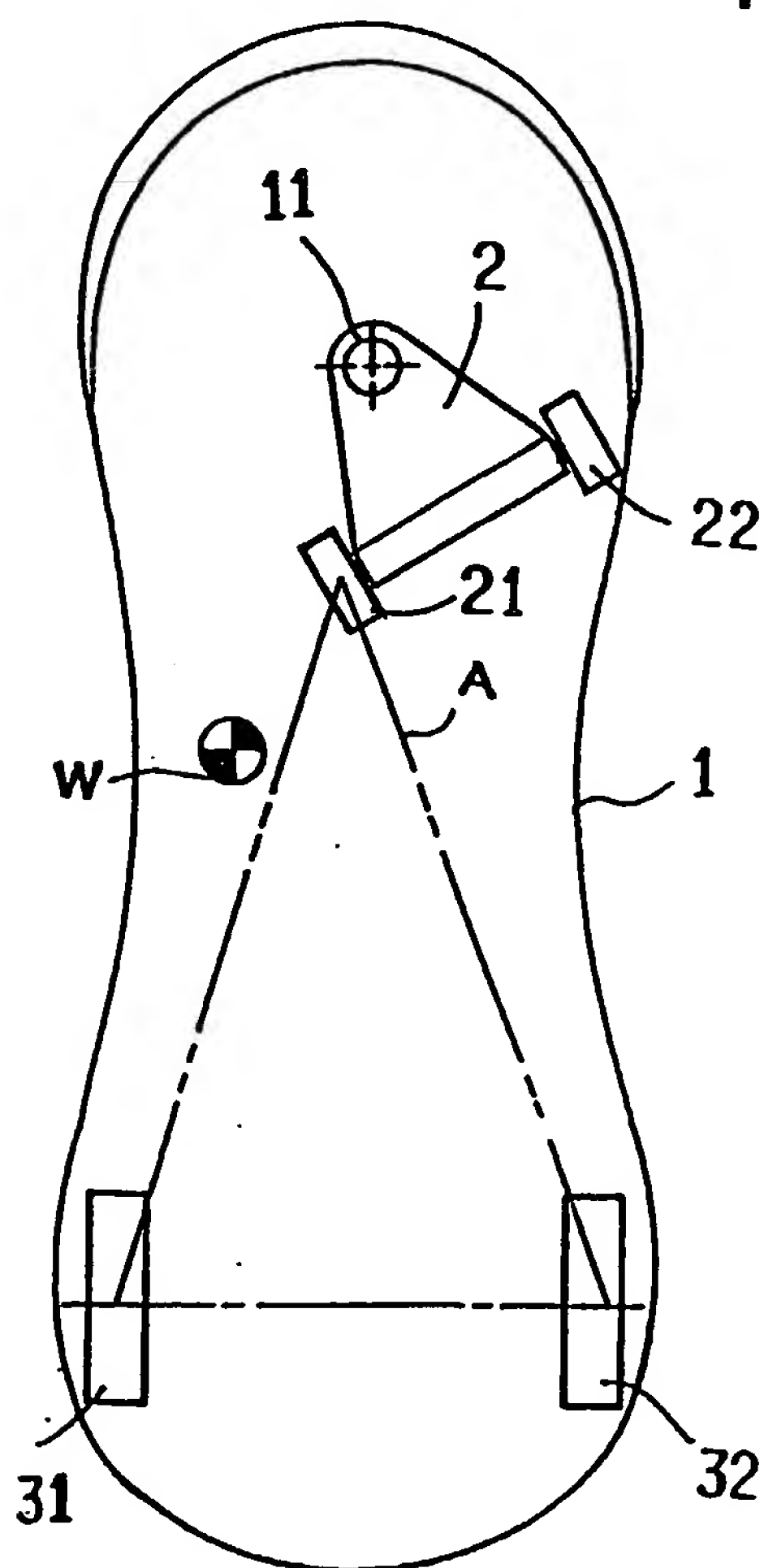


FIG.5

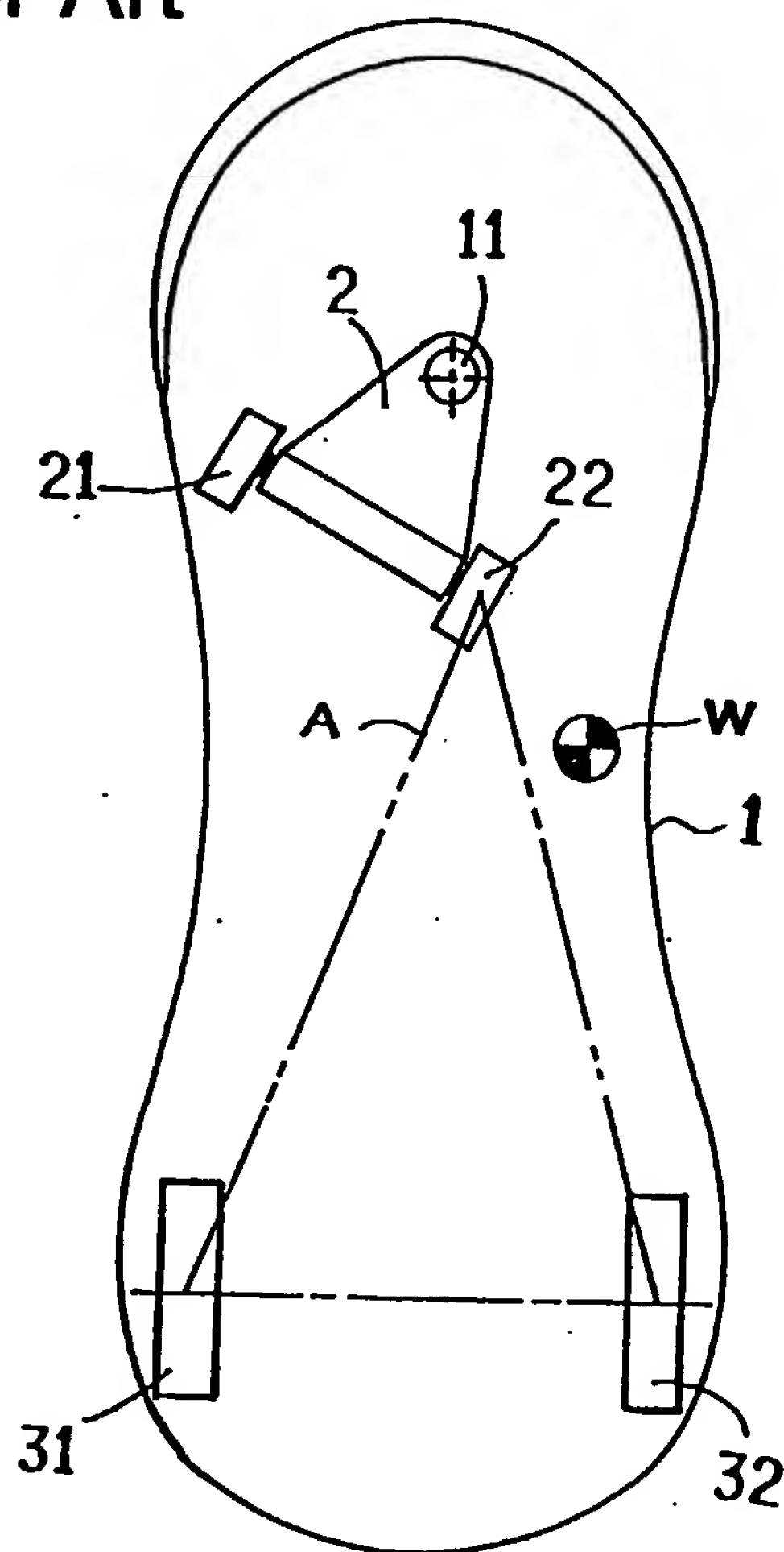
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**FIG. 1**  
**Prior Art**



**FIG. 2**  
**Prior Art**



**FIG. 3**  
**Prior Art**

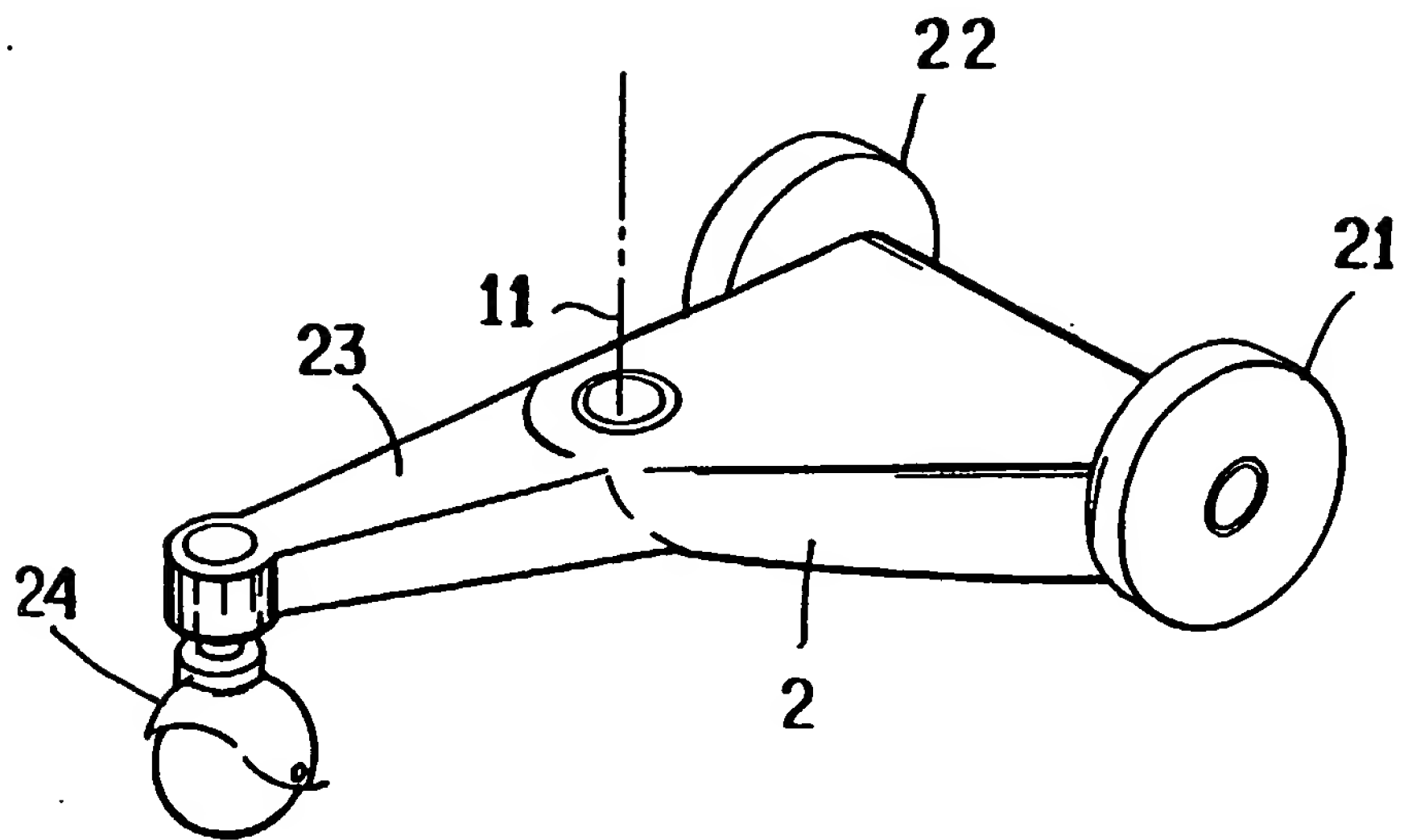


FIG. 4

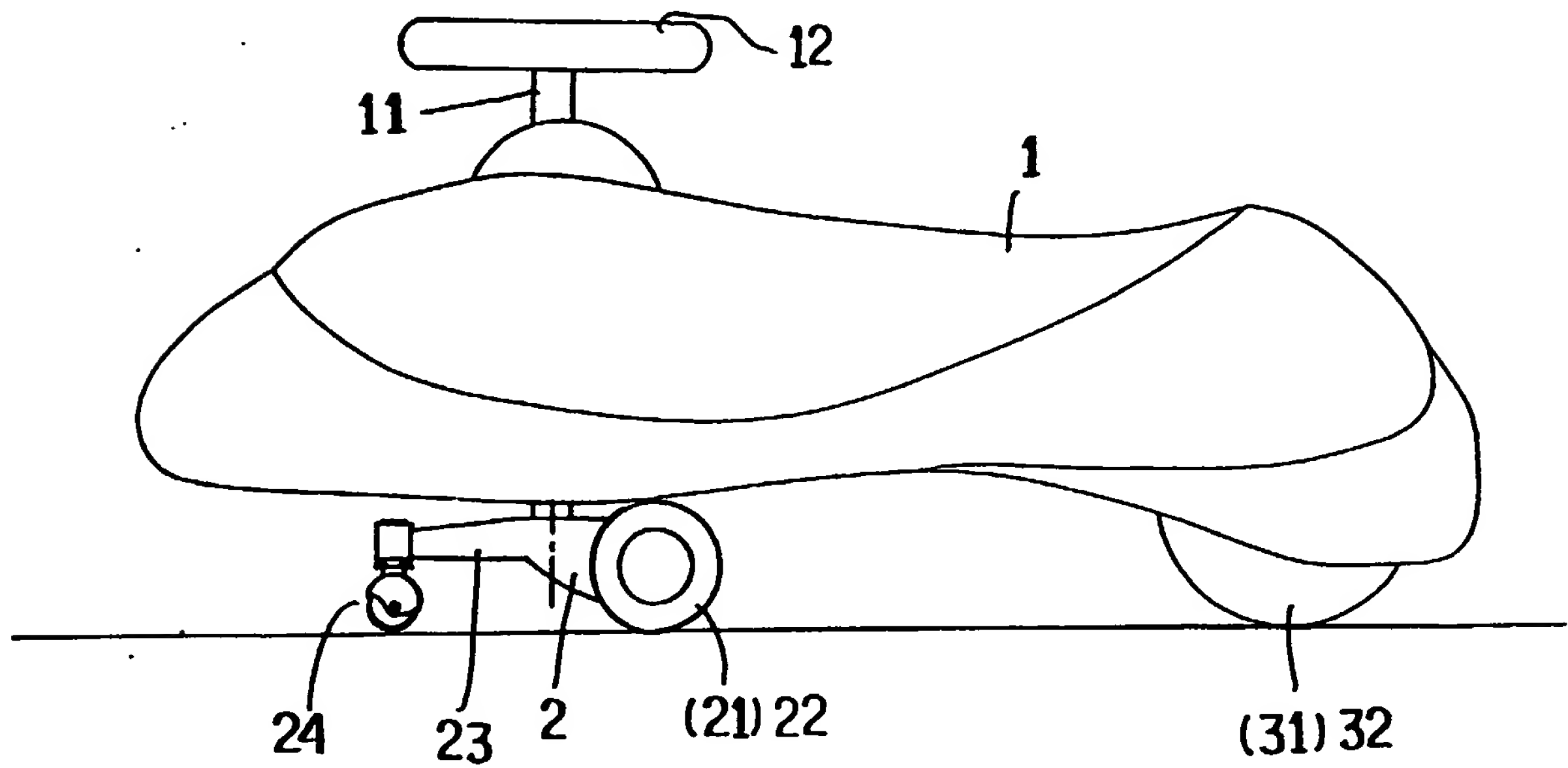


FIG. 5

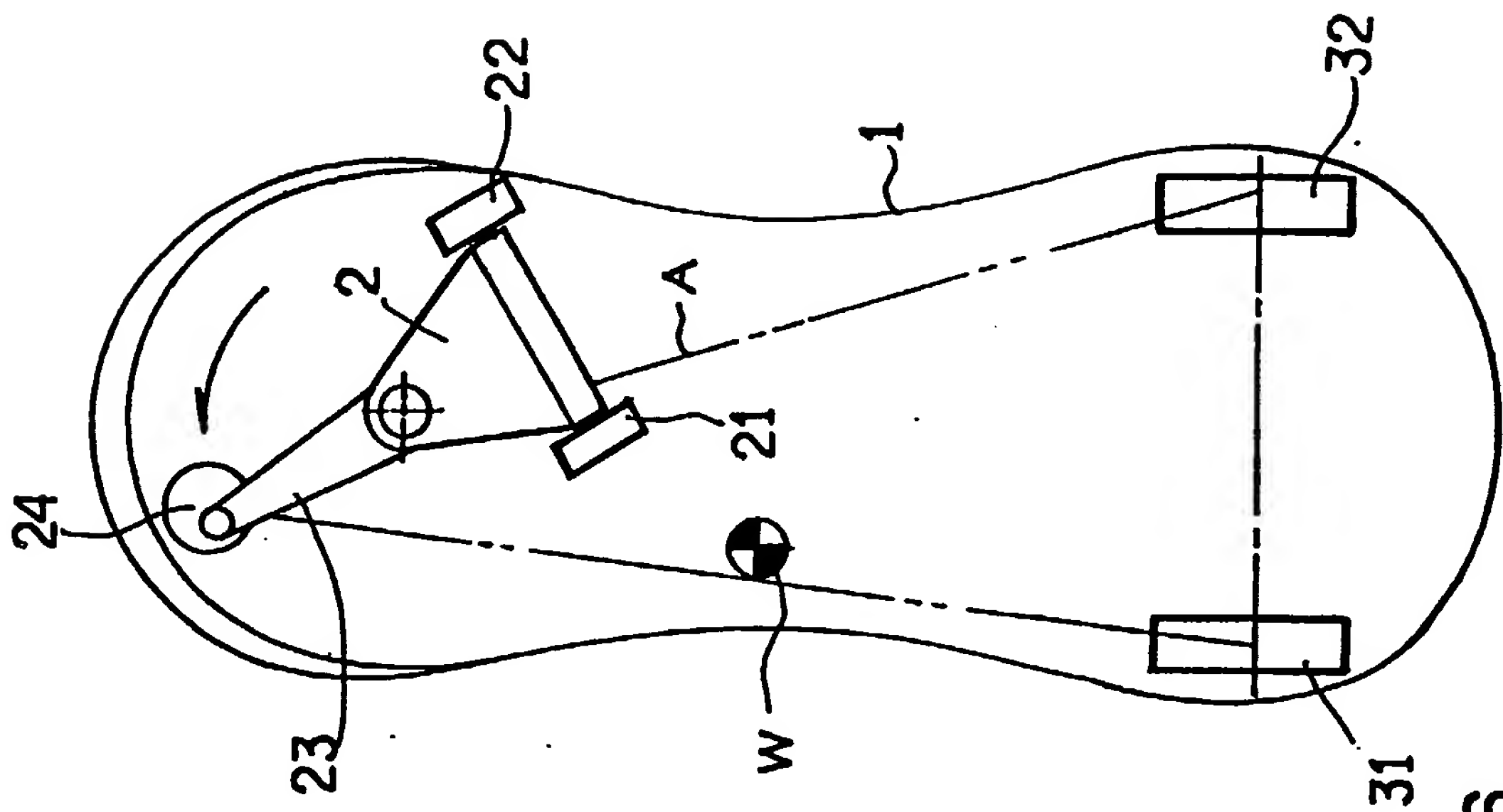


FIG. 6

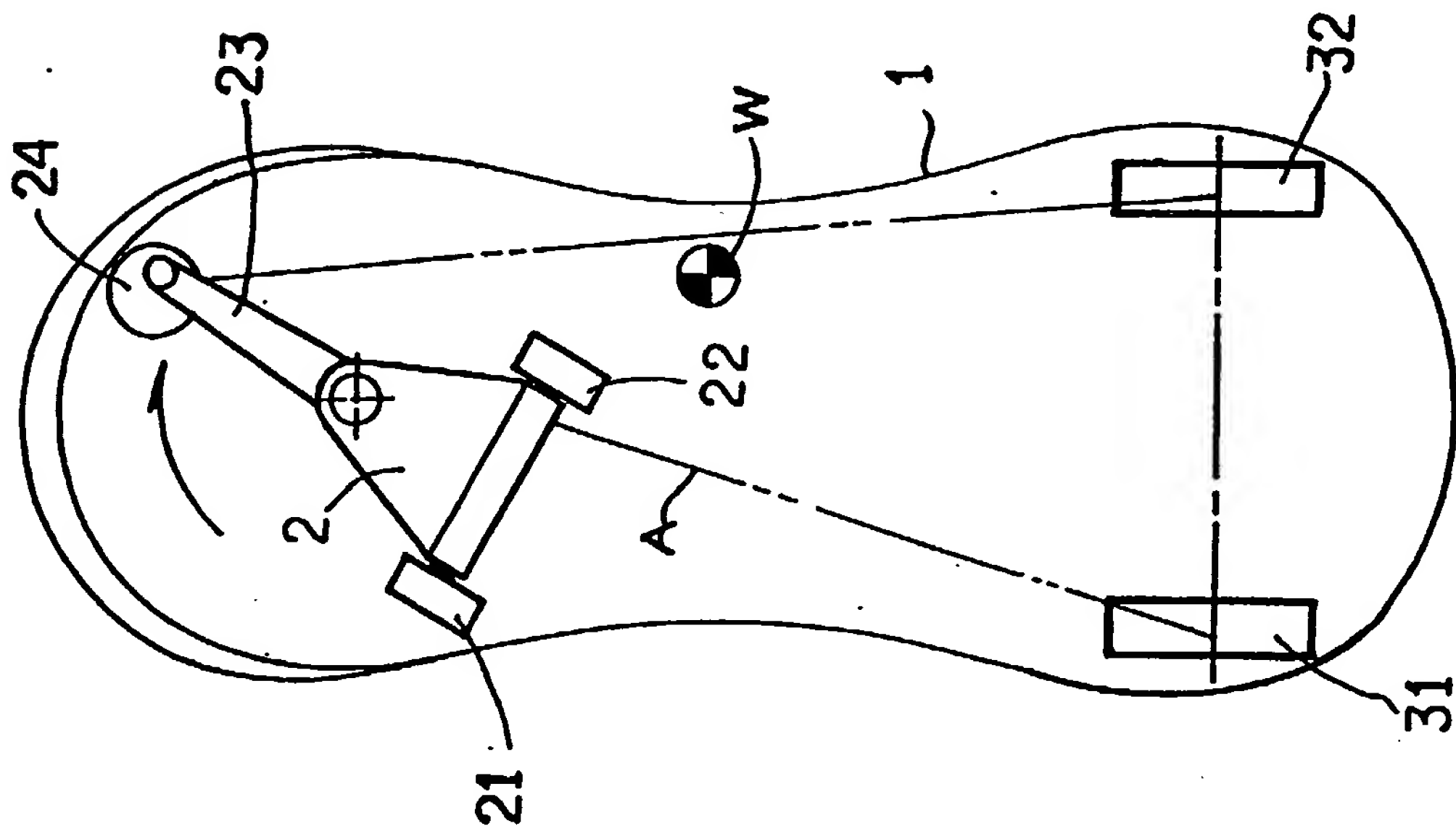


FIG. 7

## **Safety Driving Equipment for Toddler's Scooter**

### **BACKGROUND OF THE INVENTION**

#### **1) FIELD OF THE INVENTION**

5       The invention herein relates to a safety driving equipment for a toddler's scooter, mainly to provide an auxiliary wheel, relative to the rear wheels of the scooter body, to the driving structure of a toy scooter to increase the safety area and regulating the location of the force center.

#### **2) DESCRIPTION OF THE PRIOR ART**

10       As shown in Figures 1, the side elevation isometric drawing of a conventional scooter structure comprises of a scooter body (1), mounted with live left and right rear wheels (31, 32) at the rear; in the front, one vertically disposed shaft level (11) with handlebars (12) connected on the top and a driving triangular base (2) fastened at the bottom mounted with left and right  
15   rear driving wheels (21, 22); the rider straddled on the scooter body (1) turns the handlebars (12) by hands to drive the triangular base (2) connected through the shaft level (11), thereby to move the left and the right driving wheels (21, 22) alternatively to achieve the function of wobbling movement in arcuation.

Referring to FIGs. 2 and 3, as shown in the bird's-eye view, the driving  
20   triangular base (2) centered by the shaft level (11) moves to the left or the right sides to enable the left and the right driving wheels (21, 22) to achieve the purpose of arcuate approach alternatively; furthermore, as the force center (W)

on the triangular base swings in a great arc, the force center (W) will define a safety area (A), usually at one of the auxiliary wheel on the driving triangular base and relative to the left rear wheel (31) or the right rear wheel (32) ; if the force center (W) locates within the safety area (A), the scooter body will not  
5 flip over; while moving in a fast speed, the handlebars (12) operated by hands will generate a reaction force which will make the force center (W) to receive a pulling force and shift its position; if the reaction force exceeds a certain degree (while the handlebars are forcefully operated) and accelerates by the inertia force generated from the mass of the human body in a fast proceeding speed,  
10 the force center (W) will easily move beyond the safety area (A) and causes the danger of having the scooter body tumble forward and oblique; just as shown in the said Figures, while moving the scooter by operating the shaft level (11) through the handlebars, the triangular base (2) will deviate to right or left due to the generated reaction force and adding in the proceeding inertia of driving, the  
15 force center (W) will usually exceed the congruent sides of the triangular safety base; therefore, scooters similar to this kind tend to flip over.

## **SUMMARY OF THE INVENTION**

Specifically, the invention herein is consisted of an extended wheel arm at the end relative to the driving wheels of the driving triangular base; an  
20 auxiliary wheel capable of making universal rolling is mounted lively at the end of the wheel arm; the driving triangular base is driven by the handlebars of the scooter body through the shaft level; therefore, by moving around based on

the shaft level as the center and utilizing the relationship of the auxiliary wheel relative to the rear wheels of the scooter body to increase the possibility of locating the force center in the regulated safety area.

To enable a further understanding of the said objectives, the technological methods and the efficiency of the invention herein, the brief description of the drawings below is followed by detail description of the preferred embodiment.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 is a side elevation drawing of a conventional scooter.

Figure 2 is an isometric drawing of the deviated force center on a conventional scooter in wobbling.

Figure 3 is a second isometric drawing of the deviated force center on a conventional scooter in wobbling.

Figure 4 is a pictorial drawing of the invention herein.

Figure 5 is a pictorial drawing of the safety equipment constructed according to the invention herein.

Figure 6 is the first isometric drawing of the invention herein in functional operation.

Figure 7 is the second isometric drawing of the invention herein in functional operation.

## **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring to FIG. 4, to prevent the problem of having the tendency to flip over of the conventional scooter, an extended forward wheel arm (23) is mounted at the front end of the driving triangular base; an auxiliary wheel (24) capable of making universal rolling mounted at the end of the wheel arm (23) and relative to the center forward position of the rear driving wheels (21, 22); therefore, while the handlebars are operated to drive, through the center point defined by the disposed shaft level (11), as shown in FIG. 5, to make the triangular base (2) to swing right and left, and also through the said triangular base (2) to gear the driving wheels (21, 22) to proceed arcuately to left or right.

Referring to FIGs. 6 and 7, since there is an auxiliary wheel (24) mounted lively at the end of the back of the front wheel arm (23) on the triangular base (2), if the scooter body makes more obvious bounce during the proceeding movement, the said auxiliary wheel (24) will allow the forward touching point fall directly on the said auxiliary wheel (24); also as shown in FIG. 6, if the gravity force of the whole scooter body (1) leaning forward falls on the auxiliary wheel (24), the said auxiliary wheel (24) relative to the two rear wheels (31, 32) mounted on the rear sides of the scooter body (1) will immediately define a larger triangular safety supporting area (A), just as the force center (W) shown in FIGs. 2 and 3, (with the same momentum, the deviating position will be the same), the force center will be regulated within the larger safety area (A), even when the handlebars are operated to deviate to



the right, as shown in FIG. 7, the auxiliary wheel (24) relative to the rear wheels (31, 32) will as well define a larger safety area (A) allowing the force center (W) to be regulated to shift within the safety area (A), therefore, protecting the scooter from the danger of flipping over; by means of the  
5 universal wheel (24) mounted at the end of the extended forward wheel arm (23) on the triangular base (2) to efficiently enlarge the access to the safety area and enable the force center (W) still shift within the said larger safety area even if the force center deviates; furthermore, the auxiliary wheel (24) is a universal wheel; so either because of automatic movement, under forcing or  
10 wobbling operation, the universal wheel will move along to any direction without encountering the obstacle caused by the angle of proceeding; basically, to have the universal wheel with the height from the ground higher than that of the driving wheels (21, 22) and the auxiliary wheel (24) cooperating in time with the rear wheels (31, 32) to form a larger safety area when the scooter body  
15 (1) bounces obviously during proceeding or the force center deviates, thus, the equipment properly and efficiently achieves the safety purpose.

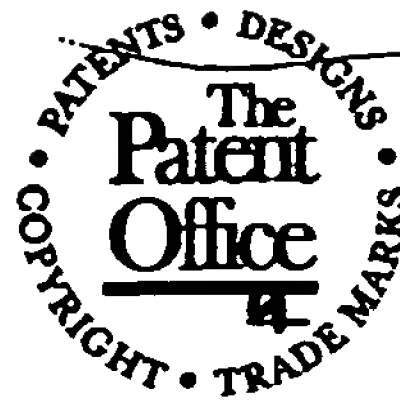
Furthermore, the length of the wheel arm (23) is better limited within the outer rim of the scooter body; if too long, the burden of operation the wobble will be effected; if too short, then there is no functional meaning; in fact, the  
20 length should be the diameter of the arcuate movement of the auxiliary wheel (24) no longer than the wheel base between the two rear wheels.

**Therefore, the invention herein provides a safety driving equipment for the toddler's scooter.**

## **CLAIMS**

1. A scooter comprising: a scooter body; handlebar means connected to a first  
end of a substantially vertical shaft passing through the scooter body  
5 proximate a front end thereof; a base plate connected to an opposed second  
end of the shaft; and rear wheels connected to the scooter body proximate a  
rear end of the scooter body opposed to the front end; wherein the base  
plate is provided inward of the shaft with first and second driving wheels  
for steering the scooter by rotation of the shaft about a longitudinal axis  
10 thereof using the handle bar means and an auxiliary wheel outward of the  
shaft defining a first area of stable equilibrium defined by the points of  
contact with a ground surface of the rear wheels and the auxiliary wheel  
through which the centre of gravity of the scooter and a rider acts which is  
greater than a second area of equilibrium defined by the points of contact of  
15 one of the driving wheels in contact with the ground surface and the rear  
wheels.
2. A scooter as claimed in claim 1, wherein the point of contact of the  
auxiliary wheel with the ground surface is inward with respect to the  
scooter of a plane defined by the points of contact with the ground surface  
20 of the rear wheels and the driving wheels.
3. A scooter as claimed in claims 1 or 2, wherein the auxiliary wheel is located  
on an arm of the base plate, such that a segment of a circle described by the  
arm during rotation of the vertical shaft is wholly within a periphery of the  
scooter body.
- 25 4. A scooter as claimed in any of the preceding claims, wherein the auxiliary  
wheel is a universal wheel, capable of rotation in any direction over the  
ground surface.

5. A safety driving equipment for a toddler's scooter, especially a safety driving equipment to provide an extended larger safety area for the moving toy scooter, of which:
- a scooter body, with a forward handlebars, vertically disposed with a shaft level connected to a driving triangular base at the bottom and with rear wheels at the rear of the scooter body, is characterized in having an auxiliary wheel extended to the other end relative to the driving wheels of the driving triangular base.
6. A safety driving equipment as claimed in claim 5, wherein the height from the ground of the said auxiliary wheel is higher than the driving wheels.
7. A safety driving equipment as claimed in claims 5 and 6, wherein the length of a wheel arm connected to the auxiliary wheel is not longer than that of an outer rim of the scooter body.
8. A safety driving equipment as claimed in any of claims 5 to 8, the auxiliary wheel is a universal wheel.
9. A scooter substantially as hereinbefore described with reference to and as illustrated in figures 4 to 7 of the accompanying drawings.



INVESTOR IN PEOPLE

Application No: GB 0101734.2  
Claims searched: 1-9

Examiner: Roger Binding  
Date of search: 26 April 2001

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): B7E (ECX, ESX); A6M (MEF)

Int Cl (Ed.7): B62K 5/00, 5/08, 9/00, 17/00; A63G 19/00, 19/18

Other: Online WPI EPODOC JAPIO

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	EP 0234851 A2 (APRICA KASSAD), see page 10, lines 13 to 16, and page 11, lines 14 to 19.	1-3, 5-7

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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